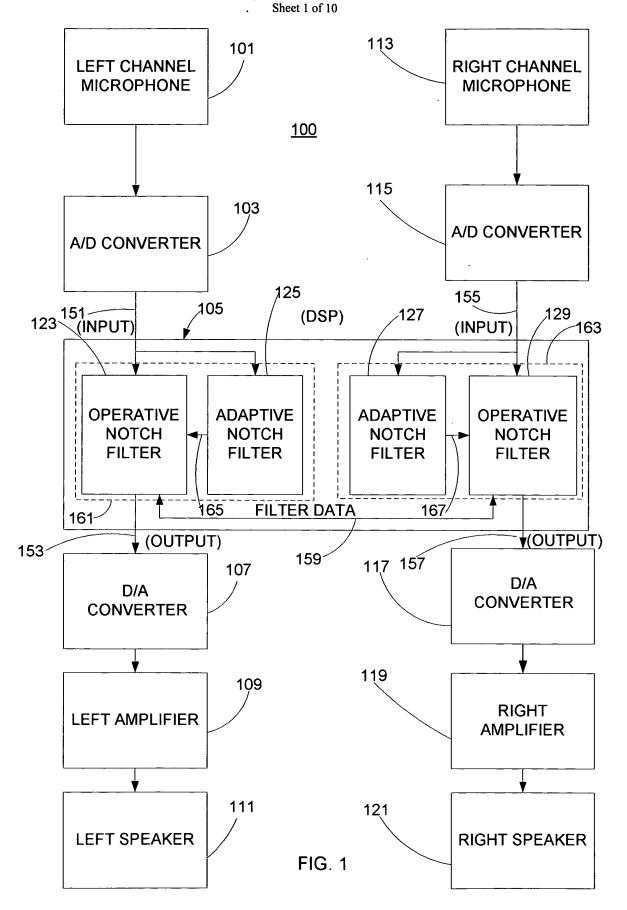
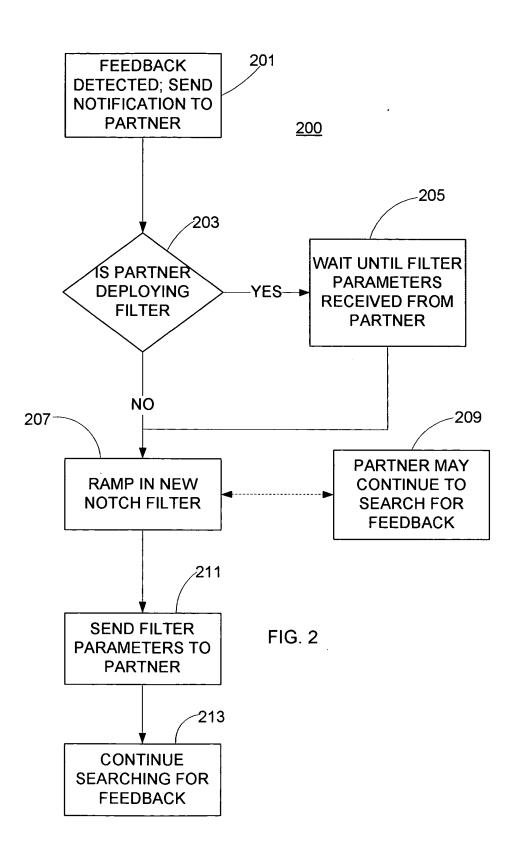
Title: Multi-Channel Digital Feedback Reducer System Inventor: Abraham Filed: February 25, 2004 Attorney Docket No. 010886.00633



Title: Multi-Channel Digital Feedback Reducer System
Inventor: Abraham
Filed: February 25, 2004
Attorney Docket No. 010886.00633
. Sheet 2 of 10



Title: Multi-Channel Digital Feedback Reducer System
Inventor: Abraham
Filed: February 25, 2004
Attorney Docket No. 010886.00633
Sheet 3 of 10

	323 <	,325 · Sneet	3 of 10	7 329~						
_	<del></del>		32							
		EXEMPLARY EVENT SCENARIO								
	TIME	EVENT	LEFT DFR /	RIGHT DFR						
301	DURATION									
	1		DETECTOR	DETECTOR						
			RUNNING	RUNNING						
303	2	FEEDBACK	DETECTOR	SEND						
		DETECTED ON	RUNNING	SEMAPHORE						
		RIGHT CHANNEL								
305	3		RECEIVE	EITHER DEEPEN						
`_			SEMAPHORE	EXISTING NOTCH						
				OR CREATE NEW						
207				FILTER						
307	4		DETECTOR	RAMP NOTCH						
			RUNNING	FILTER						
309	5	FEEDBACK	SEND	CONTINUE						
		DETECTED ON	SEMAPHORE	RAMPING FILTER						
		LEFT CHANNEL								
311	6		WAIT	SEND FILTER						
_				PARAMETERS						
242	7		CONFIGURE	DETECTOR						
313			NOTCH FILTER	RUNNING						
			ACCORDING TO							
			RECEIVED							
- A			PARAMETERS							
315	8		DEPLOY NOTCH	=						
247			FILTER	RUNNING						
317	9		SEND FILTER	DETECTOR						
_			PARAMETERS	RUNNING						
319	10			CONFIGURE						
				NOTCH FILTER						
				ACCORDING TO						
				RECEIVED						
224				PARAMETERS						
321	11		DETECTOR	DETECTOR						
			RUNNING	RUNNING						

Attorney Docket No. 010886.00633 Sheet 4 of 10 401 **START** 411 400 В 403 NOT(DETECT FEEDBACK) AND NOT(RECEIVE SEMAPHORE) AND **NOT(RECEIVE FILTER DETECTING** PARAMETERS) **COMPLETÉ DETECT RECEIVE** FEEDBACK/ **FILTER** SEND PARAMETERS COMPLETE SEMAPHORE/ 405 CONFIGURE NOTCH FILTER ACCORDING RECEIVE TO SEMAPHORE. OTHER\_PARAMETERS 407 **CONFIGURE NOTCH** NOT(COMPLETE) FILTER ACCORDING TO OWN\_PARAMETERS 409 Α NOT(COMPLETE) FIG. 4

Title: Multi-Channel Digital Feedback Reducer System Inventor: Abraham Filed: February 25, 2004

Filed: February 25, 2004 Attorney Docket No. 010886.00633 Sheet 5 of 10 409 Α 501 **DETECT** NOT(DETECT FEEDBACK/ FEEDBACK) SEND **AND SEMAPHORE** NOT(RECEIVE **DETECTING FILTER** PARAMETERS) RECEIVE FILTER 505 503 **PARAMETERS CONFIGURE NOTCH** FILTER ACCORDING NOT RECEIVE TO FILTER **WAIT** OTHER\_PARAMETERS PARAMETERS) NOT(COMPLETE) COMPLETE 507 **RECEIVE FILTER** В **PARAMETERS** CONFIGURE NOTCH FILTER ACCORDING TO 411 OTHER PARAMETERS 509-COMPLETE NOT(COMPLETE) **CONFIGURE NOTCH** <u>500</u> FILTER ACCORDING TO 411 **OWN PARAMETERS COMPLETE** В FIG. 5 NOT(COMPLETE)

Title: Multi-Channel Digital Feedback Reducer System Inventor: Abraham

Title: Multi-Channel Digital Feedback Reducer System Inventor: Abraham Filed: February 25, 2004 Attorney Docket No. 010886,00633 741 Sheet 6 of 10 В 610 **GENERATE FIRST** RECEIVE NEW DIGITAL **RESULTANT VALUE BY INPUT SAMPLE** TAKING ABSOLUTE **VALUE OF FIRST REMAINDER VALUES** AND AVERAGING OVER 612\_ TIME 618 PERFORM AUTOMATIC **GAIN CONTROL** 620 EXECUTE ADAPTIVE FILTER ALGORITHM AT 614 **SECOND NOTCH** VALUE **EXECUTE ADAPTIVE** NOTCH FILTER **ALGORITHM TO** 622 LOCATE FEEDBACK AT **GENERATE SECOND** FIRST NOTCH VALUE REMAINDER VALUES BY SUBTRACTING 616 **RESULTS OF** PRECEDING STEP GENERATE FIRST FROM INPUT REMAINDER VALUES BY SUBTRACTING **RESULTS OF** 624 PRECEDING STEP GENERATE SECOND FROM INPUT RESULTANT VALUE BY TAKING ABSOLUTE VALUE OF SECOND PARAMETER AND

FIG. 6

600

**AVERAGING OVER** 

TIME

Α

625

Inventor: Abraham Filed: February 25, 2004 Attorney Docket No. 010886.00633 Sheet 7 of 10 **COMPARE RATIO OF** FIRST AND SECOND **RESULTANT VALUES** 726 625 730 -728 **DOES RATIO** RESET NO **EXCEED 30 DB** COUNTER -732 YES **INCREMENT COUNTER** FIG. 7 DOES COUNTER **EXCEED F\_COUNT** 734 YES SET NOTCH VALUE OF 736 FEEDBACK FOR **OPERATIVE NOTCH FILTER** NO **EXECUTE FILTER** 738 **ALGORITHM FOR** FEEDBACK OF OPERATIVE **NOTCH FILTER** 740 741 WAIT FOR NEXT

**SAMPLE** 

Title: Multi-Channel Digital Feedback Reducer System

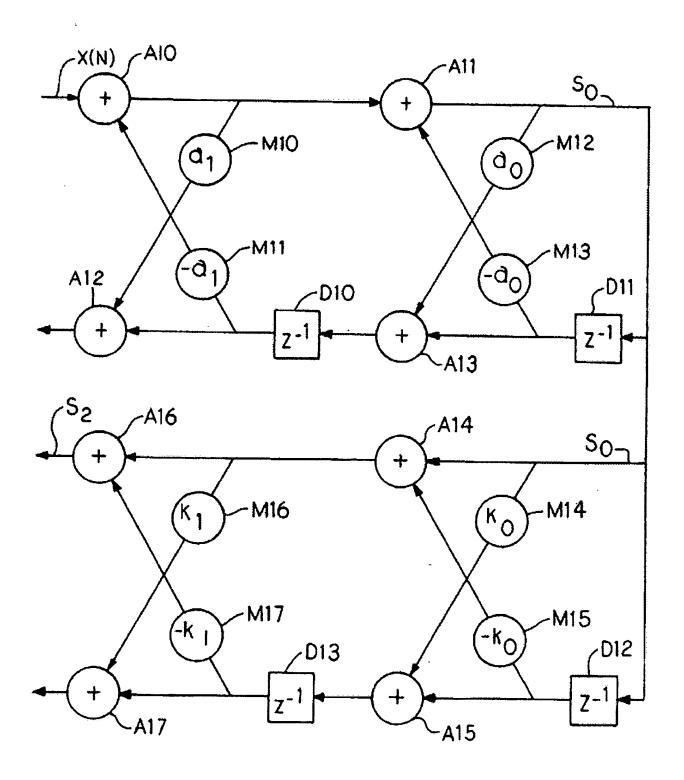
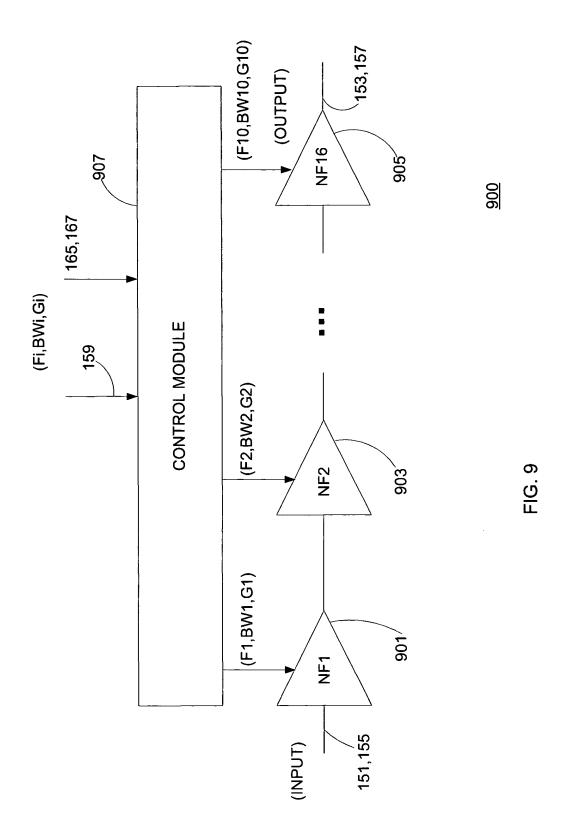


FIG. 8

## Title: Multi-Channel Digital Feedback Reducer System Inventor: Abraham Filed: February 25, 2004 Attorney Docket No. 010886.00633 . Sheet 9 of 10



Title: Multi-Channel Digital Feedback Reducer System
Inventor: Abraham
Filed: February 25, 2004
Attorney Docket No. 010886.00633
. Sheet 10 of 10

· · · ·

	EXEMPLARY PERFORMANCE DATA OF A DUAL-CHANNEL DFR									
l		1003		1005		1007				
Į	▼ 1009-	Tri	al 11011		al 21015	1017 Tria	al 31019			
	Freq.	Single CH	Dual CH	Single CH	Dual CH	Single CH	Dual CH			
	100	2.313	1.816	2.866	1.862	3.197	3.022			
	200	3.050	2.292	2.826	1.813	3.019	2.067			
	400	2.018	1.602	1.795	1.361	1.911	1.279			
	800	1.757	1.259	1.716	1.359	1.710	1.215			
	1600	1.785	1.215	1.610	1.358	1.727	1.349			
1021	3200	1.757	1.359	1.661	1.299	1.661	1.334			
	6400	1.713	1.223	1.566	1.260	1.656	1.158			
	12800	1.627	1.332	1.682	1.308	1.634	1.309			
000	-AVERAGE	2.003	1.512	1.965	1.453	2.064	1.592			
023	AVERAGE (S	SINGLE CH	): 2.011 seco	nds						
	AVERAGE (DUAL CH): 1.519 seconds									
1025 ີ										

<u>1000</u>